

# transmission

The DFS magazine

**Crisis-proof**

**Pragmatic action in difficult times**



## Dear reader

The Swiss playwright and novelist Max Frisch once said: "A crisis is a productive state. You simply have to get rid of its aftertaste of catastrophe." I think this attitude is essential in our day and age. Now that we have moved from the COVID-19 crisis directly into the energy crisis, prophets of gloom are of little use to us. What we need is a pragmatic and optimistic approach to deal with the current problems. This is also true as regards global climate change.

In this issue of *transmission*, we show how we, as the German air navigation service provider, are tackling the energy crisis and promoting environmental and climate protection. Among other things, we provide information on how DFS generates energy and what savings we can make. As part of the nation's critical infrastructure, it is essential for DFS that our power supply is guaranteed without interruption at all times. We have our own highly efficient energy plant, which was extensively modernised a few years ago. This is a way to not only protect the environment, but also our budget.

The topic of green flying is also being advanced at DFS. We want to do everything we can as an air navigation service provider to play our part. In the long term, new

technologies, such as sustainable aviation fuel (SAF), will make climate-neutral flying possible. The company is also making a contribution to the switch to renewable energy sources. Thanks to a new formula, we have been able to change the size of the protected area around our navigation facilities which they need to operate properly without interference. This means more wind turbines can be erected in areas which previously would have been set aside as protected areas. Technological progress also offers the possibility of operating air traffic control systems in a more energy-efficient manner.

DFS is actively and confidently facing the challenges of our time. Our Eco Management and Audit Scheme (EMAS) will make our activities systematically measurable and traceable – all the way to achieving CO<sub>2</sub> neutrality for our company.

There is a broad understanding among the Executive Board and staff that we must make our contribution to climate and environmental protection. We have a lot planned for the next few years. Crises also offer opportunities.

Sincerely

Arndt Schoenemann



**Arndt Schoenemann**  
Chairman and Chief Executive Officer

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**Prepared for the worst**  
Interview with DFS energy

## "We have always been prepared for the worst"

**DFS operates its own gas power plant at its Headquarters in Langen to supply the site and neighbouring institutions with energy.** What does the current crisis mean for the company? Two energy experts deliver some insights into the situation in Germany overall and at DFS in particular.



Stephan Ninnemann (left), energy expert at DFS, and Hagen Wernig (right), Managing Director of DFS Energy GmbH.

Electricity and gas have become exceedingly expensive. How much does this affect DFS?

HAGEN WERNIG: Both clearly impact us. At the Langen Campus, DFS is particularly affected by the increase in gas prices. In our energy plant, we use gas to generate electricity, and we use the resulting heat for heating and cooling as well as for steam generation. It is different at the branches, where the price of electricity plays a bigger role. Natural gas is only used at some locations, and exclusively for heating.

What happens when gas becomes scarce?

WERNIG: In the event of a gas shortage, the German Federal Network Agency would take on the role of a load distributor. It would then decide who gets how much gas when there is no longer enough for everyone. In addition to the legal regulations, this Agency has also defined in more detail who is considered a "protected consumer" in a gas shortage situation. In addition to household customers, these include consumers who provide basic social services, hospitals for example. Consumers with sovereign tasks are also included. We at DFS Energy therefore

assume that both DFS and the Paul Ehrlich Institute are protected consumers.

[When the gas runs out, do they just turn off the gas supply?](#)

WERNIG: No. The affected consumers would then be served with an order from the Agency stating that they should reduce their gas consumption by a specific percentage. Even if DFS, as a protected customer, were required to do so, I assume that this reduction would be a maximum of 10 to 20 percent.

[If the order comes to use 20 percent less gas, what would the company do then?](#)

WERNIG: The first thing we would do is reduce the use of gas for electricity generation and get more electricity from the public grid. That would not be a problem and wouldn't limit our security of supply either. Secondly, we would no longer run our boilers on gas, but on heating oil. However, we actually only need them for peak loads during heat extraction, when the temperature is extremely low. We benefit from the fact that the energy plant is basically designed to operate completely without external gas or electricity. This is due to the stringent requirements of DFS and the PEI for security of supply. If the public electricity and gas supply fails, we can supply ourselves independently in "island mode" for a certain period of time. We have backup generators that run on diesel for this purpose. We are also independent of the city water supply thanks to our own well. We have always been prepared for the worst. However, this type of operation is really only intended for emergency situations when nothing else works.

[Is the plant reliant on natural gas? Or could gas be replaced by another energy source?](#)

WERNIG: Natural gas cannot be replaced in the short term. We have a very modern, very efficient and very low-emission plant which is designed for gas. In the long term, therefore, the only option is another gaseous fuel. We can't simply switch to wood pellets. We have

already investigated the use of alternatives to natural gas, but so far without a satisfactory result.

STEPHAN NINNEMANN: The main problem is the lack of availability. Biomethane, that is biogas, would be a possibility – but that is currently still more expensive than natural gas. Moreover, the quantities available on the market are nowhere near enough. Green hydrogen – hydrogen produced with renewable energy sources – could be an alternative at some point in the future. But so far, this option of using the overcapacities from renewable energy sources has not yet played a practical role. The complete infrastructure is still missing. Photovoltaics are also not an alternative for the Langen Campus. Even if we fully equip all the large DFS buildings in Langen with solar panels, we will cover perhaps two percent of the electricity demand on Campus. That is simply not economic.

WERNIG: We generate considerable amounts of energy, and you can't just produce it for free. Especially not with our requirement for the security of supply.

NINNEMANN: Even as a supplement, photovoltaics would not make sense. It would displace electricity generated from our combined heat and energy plant: The heat produced by this type of electricity generation would be missing. This would then have to be generated again in boilers fired with natural gas. That would be completely counterproductive.

[Gas customers nationwide are currently receiving mail from their suppliers with price hikes. How much more does DFS currently have to pay for its gas?](#)

WERNIG: On the wholesale exchange, the gas price increased more than tenfold compared to 2021, and in the meantime, it has been even higher. But that is not the price we are currently paying. We already secured our gas for 2022 in the prior year. Procuring gas through a gas supplier has so far been on the basis of a full supply contract, which is virtually an all-round carefree package for the

consumer. However, this is currently no longer feasible. If we want to stock up on natural gas for the next few years, we have to resort to products that are traded on the exchange. So-called bands can be procured on the exchange for a specific period of time, for example one megawatt of natural gas for one year, one quarter or one month. Daily fluctuations in the demand for gas that exceed these bands must be procured on the spot market. This is the market where gas is traded in the short term, at correspondingly high prices. Gas has not only become more expensive it is also becoming more cumbersome to procure.

#### How has DFS gone about purchasing the gas it needs so far?

WERNIG: Up till now, we have procured gas one year in advance. Procurement was spread over the entire year, so the gas price for the actual year of delivery corresponded to the average market price for natural gas from the previous year. This had always worked well, also because the range of gas price fluctuations in the past years was much smaller than is currently the case. And there was no price advantage from buying natural gas early for several years because the prices were the same for the next three years. It's different now. About a year ago prices drifted apart: If we buy for 2024 and 2025 today, prices are well below those for 2023. So, we will not only procure the gas for next year, but we will also stock up on significant gas volumes for 2024 and 2025.

#### Are there any ways for the energy plant to somehow limit the extremely high procurement costs for gas?

WERNIG: Since its beginnings in the late 1980s, the energy plant has focused on providing a secure supply for the Langen Campus. Security of supply has always been the top priority. In view of the current situation, however, we have to consider whether to continue to adhere to this basic principle. As an alternative to the current operating philosophy, we could flexibly align the operation of the plant with the current prices on the electricity market.

#### What does that mean?

WERNIG: This means that when the price of electricity is low, we cut back on electricity generation. We'd then procure the electricity we need on Campus from the market. In the event of an extremely low or even negative price, we could even suspend our power generation completely. This will allow us to cover our electricity needs cheaply and save on expensive natural gas. Of course, this also works in the opposite case. Redundancy in the generation plants allows us to generate more electricity than we need on Campus. Therefore, we could generate and market electricity in a targeted manner during times of high prices. This could reduce our overall energy costs.

#### That sounds complicated. Is it realistic?

WERNIG: Of course, we'd need a partner to take over market observation and electricity marketing, but such providers exist. Technically, this would not be a problem; the plant configuration can be changed within minutes. So, we'd have to decide for each day how to run the plant, whether to push power to the grid, reduce our power generation or to stay in normal operation. However, this approach requires a move away from a form of operation that is primarily focused on security of supply. The economic advantages must now be weighed against the disadvantages. In my view, however, the restrictions on security of supply are manageable.

#### What other options are available?

NINNEMANN: Energy saving. Basically, it's quite simple: we need the gas in the energy plant primarily to generate electricity for the Campus. When DFS saves on electricity, this is reflected one-to-one in the gas bill of the energy plant.

#### What are the biggest power guzzlers on Campus?

NINNEMANN: Our main consumers are the technical facilities, the large server rooms or the numerous reference systems. If we want to consume significantly less energy, we'd

have to switch off systems, either completely or in phases. There are already ideas for this; a survey is currently being conducted in the company as to which systems could be considered for this.

Since the beginning of September, two official ordinances to secure the energy supply have been in force, which also oblige DFS to save energy. One of the measures is to reduce the temperature in the buildings to 19 degrees. What benefit will that bring?

WERNIG: It depends on the building. In Langen, the heating water is generated by the waste heat produced during electricity generation. Only when the outdoor temperature drops into the single digits do the boilers kick in and supply additional energy, and only then does lowering the indoor temperature actually save gas. Operations rooms, on the other hand, are usually cooled and not heated. Here, lowering the temperature makes no sense at all.

NINNEMANN: We engineers must therefore always look at what is technically possible and what makes sense. All in all, it has to be said that the energy consumption of the employees is not significant compared to the consumption of our technical facilities. But, of course, it also plays a role.



View of the DFS energy plant

What can DFS do in the medium term to reduce its energy requirements?

NINNEMANN: We constantly review the energy efficiency of buildings and facilities as part of the EMAS implementation, too. And we are eliminating so-called energy sinkholes – buildings such as the old logistics centre, which has since been demolished, or the old building in Munich, which will also soon be decommissioned. In addition, whenever a heating, cooling or other air conditioning system needs to be replaced, we look at whether there is a more ecologically sound option. On Campus, we will still be dependent on natural gas in the medium term. It's different at other locations, where we want to replace natural gas with district heating [centralised heat generation and distribution within a specific geographic location]. Karlsruhe and the control tower at Nürnberg, for example, are getting a district heating connection this year. Frankfurt tower is also already heated with district heating, and by its own waste heat. At the other tower sites, it may be possible to use heat pumps, and photovoltaics to generate the additional electricity needed to operate the heat pump.

How can each person contribute to saving energy?

NINNEMANN: Everyone should be aware of how they use energy, in other words, switching off appliances that they do not need. And, very importantly, steer clear of electric heaters, they are absolute energy guzzlers. A fan heater in the office is an absolute no-go. It would be best if everyone here at work applied the same standards of energy efficiency and cost sensitivity as they do at home.

*Interview conducted by Michaela Sankowsky and Christopher Belz.*

## Green flying

**In its group strategy, DFS has committed itself to playing its part in climate-neutral flying.** Green flying is the goal.

Climate protection has long been a major pillar of the aviation industry. As long as 20 years ago, the European Commission said that improvements in air traffic management could save up to 10 percent of Europe's CO<sub>2</sub> emissions. The industry associations have committed themselves to operating in a CO<sub>2</sub>-neutral manner by 2050. DFS wants to play its part in this.

A group of experts at DFS is working to further advance green flying. However, much has already happened in the recent past.

### No traffic backups at the runway

Environmental protection begins even before the plane takes off. Together with airports and airlines, DFS ensures that engine run-up times and taxi times on the ground are minimised. Traffic backups at the runway are to be avoided. The procedure to achieve this is called Airport Collaborative Decision Making, or Airport-CDM for short, and is now in use at six major international airports in Germany: Berlin, Düsseldorf, Frankfurt, Hamburg, Munich and Stuttgart. Since its introduction, taxi times of departing aircraft at these airports have decreased by 10 percent.

The basis of Airport-CDM is the optimised exchange of information between all parties involved. The airlines indicate when the crew has completed ground handling for each departure. This is known as the target off-block time and it determines the planning for the rest of the process with a lead time of about 40 minutes. What used to be done in a rather ad-hoc manner is now meticulously planned. As a result, traffic backlogs at the runway hardly ever occur.

### Routings as direct as possible

Additional fuel consumption always occurs when air traffic does not flow smoothly. The aim of DFS is to guide aircraft directly to their

destination. The latest air traffic control systems support air traffic controllers in achieving this. They work across borders, are more efficient and even more accurate in displaying radar targets and, above all, they reduce detours and delays. This means less carbon dioxide emissions.

If the traffic situation permits, DFS controllers also issue individual clearances to the cockpit crews, who can then leave the originally planned flight path and take a shortcut, so to speak. These direct routings can shorten the travel distance considerably or make better use of existing tailwinds.

Free-route airspaces are another way to save jet fuel in cruising flight. In these sectors in upper airspace, there are no longer any traditional flight routes. Instead, only the entry and exit points are defined. Between these points, the airlines flies the route that they planned independently and is best for the flight in question, naturally still under the control of DFS. DFS introduced the first free-route airspaces in 2018.

### Continuous descent approach

Wherever possible, DFS also tries to reduce carbon dioxide emissions on the approach to airports. The procedures for this are continuous descent operations (CDO) or high transition operations (HTO). The idea behind it is that the descent should not be repeatedly interrupted by horizontal flight phases. If the aircraft descends continuously, this reduces the thrust of the engines until landing and thus reduces fuel consumption. With HTO, the continuous descent begins even earlier than with CDO, namely as early as when leaving the cruising level.

The savings potential of CDO is up to 100 litres of jet fuel compared to the conventional process. HTO (in future, Optimised Profile Descent, OPD) brings an additional reduction

of 85 litres of fuel. However, these methods can only be used when traffic volumes are low and weather conditions are favourable. The more you reduce engine output on approach, the more difficult it becomes to actively influence separation between aircraft. This makes CDO and HTO only of limited applicability, because safety always has priority.

### Better planning

The DFS AMAN arrival management system allows approach flows to be adjusted at an

early stage in order to optimally utilise the limited capacity of an airport. This prevents delays and results in the emission of fewer climate-damaging greenhouse gases.

### Outlook

Technological progress will create further opportunities to fly in a climate-neutral manner, for example through e-fuels. The air traffic control world is currently researching how to avoid contrails, which also contribute to global warming. DFS is also a driving force in this research of none-CO<sub>2</sub> effects.

–Sandra Ciupka–



Air traffic controllers at work: Supporting environmentally friendly flying is also part of their job.

## More room for wind power



**Minus 78% – this is the decrease in the size of the protected areas around Doppler omnidirectional radio beacons (known as DVORs) used in aviation for safe navigation. The protected areas ensure that the facilities can operate without interference, and reducing these areas frees up more space for the construction of wind turbines. In this way, DFS is supporting the energy transition.**

It is currently being examined whether the protected areas around DVORs can be reduced from 15 to 7 kilometres. This decision will be based on the new findings from the WERANplus research project on the interaction of wind turbines and radar/navigation conducted by the National Metrology Institute of Germany (PTB) under the auspices of DFS. The reassessment behind this move started on 1 August 2022 and is expected to be completed by the end of 2022. An improved calculation formula for forecasting the interference effect of wind turbines on conventional radio beacons (known as CVORs) will also free up space for the expansion of wind power, thus contributing to the transition to sustainable energy sources in Germany.

DFS is implementing the extensive portfolio of measures launched in January 2022 to improve the compatibility of air navigation services and wind energy. These measures were agreed with the German Federal Ministry for Digital and Transport (BMDV) and the German Federal Supervisory Authority for Air Navigation Services (BAF). The measures include changes to the navigation infrastructure, for example to reduce its susceptibility to interference, and changes to facility protection methods to reflect the latest

developments. The objective is to ensure the interference-free operation of air traffic control facilities, which is required by law, while taking energy policy concerns into account as far as possible. As a result, more space for onshore wind energy will be created.

In April 2022, the BMDV and the German Federal Ministry for Economic Affairs and Climate Protection (BMWK) also decided to review the size of DVOR protected areas. It is within these areas that air traffic control issues need to be taken into account when approving construction projects. At 36 of the 41 DVOR facilities operated by DFS, the protected area could already be reduced to 7 km from 15 km. Consequently, the area taken up by each facility has been reduced from 707 to 154 square kilometres, which corresponds to a reduction of 78 percent.

By the end of the year, inspection reports will also be evaluated or technical properties checked for the remaining facilities to reduce protected areas to the greatest extent possible. The BAF publishes a current overview of the evaluation on its website.

"DFS is making its contribution to the transition to sustainable energy sources by reducing the size of the protected areas.

Safety can and will remain at the core of the tasks of air navigation services in the future," said Friedrich-Wilhelm Menge, Chief Technology Officer (CTO) on the DFS Executive Board. "I very much welcome the fact that the intensive discussions between experts at DFS and scientists from the PTB have led to practical improvements on the ground."

#### New calculation formula for CVOR facilities

Since 1 October, additional potential for the expansion of wind energy has also been offered by an improved calculation formula for forecasting the interference effect of wind turbines on conventional radio beacons (CVOR). Expected interference stemming from wind turbines and affecting the navigation signals broadcast by radio beacons (the so-called bearing error) is predicted by means of a calculation formula. Within the framework of the WERANplus research project funded by the BMWK, DFS and the PTB were able to develop new formulae which allow more precise predictions.

For the more robust DVOR facilities, a jointly developed formula has already been used since 2020 and has led to a rise in the approvals on the air traffic control side for new wind turbines to over 90 percent. With the new calculation formula used since October this year, a higher approval rate is also expected for CVORs.

#### Changes in the navigation infrastructure

The number of omnidirectional radio beacons operated by DFS has been declining for many years. "DFS is already playing its role in the transition to sustainable energy, leading the way with its own initiatives. Since 2002, we have decommissioned 17 VHF omnidirectional radio beacons (VORs), and another 20 or so will follow by 2032 as part of the switch to satellite navigation," explained Menge. The CVORs, which are particularly sensitive to wind turbines, will almost completely disappear within the next few years: With the support of the BMWK, they will either be replaced with DVOR facilities, which are less susceptible to interference, or dismantled due to the introduction of satellite-based flight procedures. After 2030, only the omnidirectional radio beacon on Helgoland, an island located in the North Sea, is expected to be based on conventional technology, as there is no space available for a DVOR.

DFS is not only reducing the number of facilities, but is also exploiting the potential for improvement that arises in the operation of the remaining ones. Doppler omnidirectional radio beacons of newer design are characterised by very stable system behaviour. Therefore, the tolerance values relevant for turbine operation and monitoring can be tightened, thus increasing the error budget available for wind turbine expansion.

–Arved Saur–

#### Further information

The German Federal Supervisory Authority for Air Navigation Services (BAF) provides an interactive overview of the reduced protected areas:

[https://www.baf.bund.de/DE/Service/Anlagenschutz/InteraktiveKarte/interaktivekarte\\_node.html](https://www.baf.bund.de/DE/Service/Anlagenschutz/InteraktiveKarte/interaktivekarte_node.html)

Tabular overview:

[https://www.baf.bund.de/DE/Themen/Flugsicherungstechnik/Anlagenschutz/anlagenschutz\\_aktuelleThemen.htm](https://www.baf.bund.de/DE/Themen/Flugsicherungstechnik/Anlagenschutz/anlagenschutz_aktuelleThemen.htm)

## So that trees and insects can thrive

**At DFS, you might see some 'environmental scouts'.** These are young employees who volunteer to help out in projects for environmental and climate protection alongside their training or studies. The programme has been running for one and a half years now.



Michaela Sankowsky, Luca Damkröger and Miguel Carrera (from left to right) in front of one of the insect hotels they built. In the background, a so-called dead hedge, which is a barrier in a near-natural state that also serves to promote biodiversity.

Luca Damkröger was taught as a child to handle the things you own with care and not to waste anything. "This included turning off the lights when no one is in the room or not letting the tap run unnecessarily," the 22-year-old recalled. Miguel Carrera echoes these thoughts when he talks about his first formative experience with the sustainable use of resources. "Separating the rubbish, closing the doors when it's cold to avoid unnecessary heat loss, things like that," said the 21-year-old.

### Start in spring 2021

Damkröger and Carrera are both third-year students of electrical engineering and information technology at the Darmstadt University of Applied Sciences. At DFS, they are so-called dual students, alternately studying and working at DFS as part of the air navigation services engineer programme. They have one more thing in common. Both, along with 14 other DFS students and trainees, were part of the first season of DFS environmental scouts, which ran from spring 2021 to spring 2022. The environmental scouts are young

people who are training or studying at DFS and who, in addition to their training, volunteer to help out in projects involved with environmental and climate protection. The initiative was launched by Michaela Sankowsky, the DFS Environmental Protection Officer.

The 39-year-old has been working at DFS since 2008 and was mainly involved in corporate communications and corporate development. Since 2020, she has been working in environmental and climate protection, where she coordinates projects and programmes to improve the DFS climate balance. Over the past two and a half years, the media and communication expert has immersed herself in the subject of the environment, attended a number of courses and seminars, and completed a host of further training courses. The issue also plays an important role for her in her private life. "I almost only go by bicycle or use public transport," said the mother of three. "And, of course, I also think about how what we do today affects the future of my children."

#### First season with 16 scouts

The idea of the environmental scouts is connected with the introduction of EMAS at DFS. EMAS stands for Eco-Management and Audit Scheme and is a Europe-wide voluntary environmental management system. Using EMAS, DFS aims to make its environmental and climate protection goals systematically measurable and traceable. It must fulfil various requirements and implement specific things. One of the requirements is to create awareness for climate and environmental protection among the workforce and to sensitise them to this issue. "When we were thinking about how best to do this, we came up with the idea of the environmental scouts together with the human resources division," said Sankowsky, who is responsible for fulfilling the EMAS criteria at DFS. At the beginning of 2021, she

presented the idea to trainees and students. They did not need to think about it for long. By the end of the event, Sankowsky had recruited the first 16 environmental scouts, among them Damkröger and Carrera.

In their first project, the environmental scouts prepared a study in which they investigated which tree species are particularly resistant to heat and drought. Many trees at the company's HQ are not coping well with the new weather conditions. The project included a planting of birch trees, whose numbers have been greatly reduced in recent years as a result of the hot, dry summers.

"We looked for climate-resistant tree species that could also cope with the soil conditions on Campus," said Damkröger. In addition, the amount of care they needed had to be manageable so the environmental scouts worked out a cost-benefit analysis. In the end, they recommended Turkish hazel, field maple and Amur maple as potential candidates. "These are climate-resistant, low-maintenance tree species," said Miguel Carrera, who has studied the different species intensively. He grew up in the countryside and, while still at school, took part in planting campaigns organised by the "Plant for the Planet" initiative. He also initiated his own tree planting campaigns together with friends.

In their second project, Luca and Miguel, together with the other environmental scouts, built two insect hotels. These man-made shelters for insects were placed at various locations on the DFS Campus in Langen. "Insects are the basis for maintaining biodiversity," said Sankowsky. Insect hotels offer them nesting opportunities, which are harder and harder for them to find as more land is sealed with concrete and more buildings are erected.

Environmental scouts at DFS serve for one year. In spring, Luca, Miguel and their comrades-in-arms handed over the baton to the second cohort, which this time consists of nine trainees and students.

"These are young people who get involved out of conviction without thinking of their own benefit," said Sankowsky. "I am happy that we have been able to do so much in such a short time."

*–Holger Matthies–*

## We love flying

Many DFS employees are passionate about aviation in both their work lives and their private lives. *transmission* portrays some colleagues who are fascinated by the world of aviation in all its facets.



Rainer Bauernfeind has been flying since he was 14 years old. The air traffic controller now has around 5,000 flight hours and not only trains student pilots, but is himself an examiner for budding flight instructors. Glider pilots like to flock together and are at home in clubs, where usually the whole family is also involved. This was also the case in Rainer Bauernfeind's childhood. His dad flew, and he and his mother spent the whole weekend with him at the glider airfield in Straubing, Lower Bavaria, in southern Germany. "We had a caravan there and always stayed from Friday night to Sunday night," he recalled. The family lived in Regensburg at the time, a short hop in the car away. "I couldn't wait to finally be able to start flying gliders at the age of 14."

Since then, 31 years have passed and several licences and ratings have been added. After graduating upper secondary school in 1996, the Bavarian acquired his pilot's licence in the United States. His host father in Texas was an air traffic controller and took him to the control centre in Dallas, Fort Worth. That is how Rainer Bauernfeind came up with the idea of applying to DFS. Because of his thick glasses, he saw little chance of being hired as a pilot by a

renowned airline at the time. DFS was a welcome alternative.

### Specialist for Cirrus

Rainer Bauernfeind has never regretted this decision. He is a passionate air traffic controller and can combine this perfectly with his second profession as flight instructor and examiner for the German Federal Office of Civil Aviation (LBA). His wife used to be a glider pilot too, but has since let her licence lapse. He has an agreement with her: no flying at weekends and on public holidays.

Nevertheless, he manages around 350 flight hours a year. The 45-year-old flies gliders, ultra-light aircraft and light aircraft, holds a commercial pilot's licence with an instrument rating, is also certified as flight instructor and examiner for this purpose, and is an instructor and examiner of flight instructors. He is mainly in the service of a flight school located in Reichelsheim, to the north-east of Frankfurt. In addition, he is certified by the American aircraft manufacturer Cirrus as an instructor specifically for their aircraft.

The Cirrus SR22 is also one of his favourite aircraft, as is the Cessna 152 on which he obtained his private pilot licence back in the United States. "Basically, though, I like flying all aircraft," he said. He is also still frequently seen in gliders. That is the most primal way to fly, he thinks.

"Instrument flying, on the other hand, is all about mastering the technology."

As an instructor and examiner, Rainer Bauernfeind is intensively involved with the subject of safety. He regularly reads

accident reports and passes on findings to all those he trains.

He has a friendly relationship with many former flight students. Some colleagues from air traffic control have also learned to fly with him. One of them now even works as a commercial pilot in addition to his job at DFS. "It always makes me happy when my former students are so successful."

#### Committed to training the next generation

What he finds particularly exciting of all his extensive flying activities, he said, is what is known as the standardisation of flight instructors. "I sit on the back seat and watch instructors and students. I wouldn't be able to intervene at all if something went wrong." This is an unusual situation for someone who has been used to being behind the controls for 31 years.

Bauernfeind rarely flies as a passenger in commercial aircraft. With his wife, he prefers to travel around France in a caravan. Both are passionate cooks and especially enjoy the markets and restaurants of France.

When his wife still had her glider licence, they both worked together to promote young talent at the glider airfield in Straubing. Bauernfeind has remained true to this commitment, regularly organising youth camps. "I want to pass on what I'm passionate about to younger people." He also motivates friends at the club to take a youth leader course. "Gliding is a great hobby for young people. They can learn a lot of things that help them in life," he said.

This also applies to his own life. He still enjoys flying with his 72-year-old father. "I think he's pretty proud of me too."

–Sandra Ciupka–



Karin Geipel works at DFS in the Airspace Design department, where she is involved with how to use airspace most efficiently. Privately, she has been in love with flying since childhood. She started with a glider licence, moved on to powered aircraft and would love to do a planned landing on water someday.

"I have loved flying for a very long time," Karin Geipel told us. When she was 13, her father took to an aerodrome for a sightseeing flight. "That's when my enthusiasm first developed." Afterwards, she begged her parents to give her the permission to do the glider licence. A year later, at the age of 14, the minimum age allowed, Geipel started with her training at a glider club in Großrückerswalde, in Saxony in the east of Germany.

She completed her licence while still at school, but had to take a break from flying during a school year abroad and because of her post-school career. "I went straight to university after my school leaving exams," she said. "At that time, I had neither the time nor the money to fly." After graduating as an industrial engineer, the powered planes she could hear overhead at her first job rekindled her interest in flying. "I wanted to do the licence for powered aircraft," she said. She also wanted to do the licence in an area that had control zones. This way she could learn to better deal with traffic, airspace regulations and radiotelephony at the same time.

She found a suitable flight school in Memmingen near her home in Munich, where she started at the beginning of 2009, and completed it about six months later. There, she flew a DA20 Katana, a lightweight aircraft flown with a control stick. "Flying the Katana is similar to flying a glider, so I was already familiar with a few things." Geipel subsequently obtained the night flying qualification. "The sun sets quickly in the wintertime, so it's an advantage to be able to fly in the dark," she said.



Karin Geipel also associates her first great flying experience with the night flying training. She planned the compulsory cross-country flight together with her flight instructor to the then Berlin Schönefeld Airport, with the aim of eating the best currywurst in Berlin there. [A currywurst is a combination of a sausage, often cut into bite-sized chunks, smothered in ketchup laced with curry powder.] "Unfortunately, we had the worst currywurst," she recalled.

#### Favourite aircraft – the Cessna 152

"After training, I flew, flew, flew," she said. She mainly flew with pilots who had completed their training the same time as she did. "The advantage of flying with more than one person is that you can share the experience and fly to more distant destinations." With her fellow pilots, she has been to the Alps, to Salzburg in Austria with a visit to Hangar-7 in the Red Bull Museum and to bathe in Baden-Baden. "There are many well-known thermal baths in Baden-Baden that we went to," she said.

In 2010, Geipel joined DFS and moved to the Federal State of Hesse, where DFS is headquartered, when she changed jobs. "I first had to look around the area and find a suitable way to get in the air," she said. She found it at Egelsbach Airport, near Frankfurt. Since then, she has enjoyed flying the Cessna 152. The two-seater, single-engine propeller plane is from the 1950s and is a popular training aircraft found everywhere due to its low operating costs. "The 152 is like a tractor – it's reliable and stable."

She has never had a bad experience flying. "Sometimes, a landing doesn't go so well, but luckily I haven't had an engine failure or anything like that." Nevertheless, Geipel does not like to fly alone. "It's important to me to have the feeling I have everything under control," she said. "That's why I flew with a safety pilot most of the time."

#### A big dream

A few years ago, Geipel took another break from flying. "That's when life put me on the back burner in terms of flying," she said, referring to private circumstances, such as the birth of her child and building a house

with her family. Since then, she has only completed the minimum flight time required to keep her pilot's licence.

"As flying skills and knowledge diminish over time, I now feel I'm at a decision point: Do I let the rating rest or do I now fly regularly again?" The decision was not difficult for her. "My child is old enough now, so I have more time again." For about two months, Geipel has been flying a lot more again. Her big dream is to get a seaplane licence one day. A television report sparked her interest. And she would like to do it in Canada, where her parents live.

*–Sven Chamberlain–*



#### **The DFS Flying Club – All are welcome**

Back in 1966, a few aviation enthusiasts from the then German Federal Administration of Air Navigation Services (BFS), the predecessor organisation to DFS, got together and founded the BFS Flying Club. Initially, the club had a strong leisure orientation for hobby pilots, but it developed rapidly after the turn of the millennium. Flight activities were increased and pilot training intensified. Since then, the DFS Flying Club, as it is called today, has not only produced a large number of enthusiastic private pilots, but also several professional pilots who now fly for well-known airlines such as Condor or Eurowings.

Further information (in German) at [www.dfs-fliegerclub.de](http://www.dfs-fliegerclub.de).

# 40 years of successful air traffic controller selection

**DFS and the German Aerospace Centre (DLR)** have been working together for four decades on aptitude testing for air traffic control personnel.

To date, around 60,000 applicants have been tested for the role of air traffic controller. The air traffic controllers at DFS make a key contribution to ensuring the safety of air traffic. Applicants for this position must therefore display special capabilities and the requisite aptitude. Although obviously welcomed, good school or university grades are not the key prerequisites. Instead, candidates are tested systematically in a complex process over four days.

The first iterations of these processes used to test the aptitude of candidates were drawn up back in the 1980s by air traffic control experts together with psychologists from the Department of Aerospace Psychology at the DLR Institute of Aerospace Medicine in Hamburg, Germany. The test procedure has proven highly effective over the past 40 years. It has also been continuously refined to make sure that it is always in line with the latest requirements for those seeking a career in this field.

"Humans are the key factor for ensuring safety in air traffic. Selecting the most suitable applicants is therefore vital for us," commented Arndt Schoenemann, CEO at DFS. "We need this young talent so that we can continue to ensure safe and secure air traffic control in future."

## Only one chance

Among other things, the DLR aptitude test examines a candidate's spatial awareness skills, and tests their memory,

concentration and overall ability to work under pressure. Air traffic controllers are selected systematically based on scientifically empirical approaches, which are themselves repeatedly validated. Above all, operational tests in the areas of multi-tasking, auditory information processing and vigilance have therefore been developed and introduced. Vigilance is the ability to pay sustained attention to similar and thus monotonous situations. Since the test focuses primarily on skills and only requires a relatively low level of knowledge, candidates can only take it once. In international comparisons, the DLR test was the first to incorporate personality screening and examine team skills when selecting air traffic control personnel.

"As evidenced by the last 40 years of cooperation between the DLR and DFS, our common use of the latest scientific findings and compliance with the latest standards have enabled us to identify precisely those young people with the greatest aptitude for working in this demanding position", emphasised Prof Anke Kaysser-Pyzalla, Chair of DLR Executive Board. Reflecting the spirit of the partnership, the selection committee comprises DFS air traffic controllers with an instructor qualification, as well as a team of aviation psychologists from the DLR. In addition to this, selection procedures for future pilots are organised in the Hamburg-based department of the DLR.

*–Editorial team–*



Anke Kaysser-Pyzalla (DLR) and Arndt Schoenemann (DFS) on the occasion of the 40th anniversary.

Photo: DFS

## Working more closely together in upper airspace

EUROCONTROL and DFS have signed an agreement to further harmonise air navigation services in the upper airspace of Belgium, Germany, Luxembourg and the Netherlands.



Dirk Mahns, COO of DFS, Arndt Schoenemann, CEO of DFS, and Eamonn Brennan, Director General of EUROCONTROL.

The agreement will see a harmonisation of the operational and technical concepts between two centres – the DFS Karlsruhe Upper Area Control Centre (KUAC) and EUROCONTROL's Maastricht Upper Area Control Centre (MUAC) – over several steps. This harmonisation of processes, procedures and technologies will lead to a seamless experience for the user and an improvement in capacity, safety and environment. The first step is to align the concepts of operations and the necessary systems of the two air navigation service providers.

Both control centres will share technology and expertise for leading-edge air traffic flow and capacity management as well as

airspace management (ATFCM/ASM). The measures include optimising the joint airspace boundaries between KUAC and MUAC to enable improved flight profiles and traffic handling.

### Virtual infrastructure

The common system platform will be based on a virtual infrastructure which will provide services and software solutions for both centres, and which can also be potentially made available to third parties in the long term. The technological convergence allows the deployment of common system components running at two geo-redundant data centres shared between MUAC and KUAC. Services and software solutions for both control centres will be based on private

cloud technologies. There is a flexibility gain to be had from the use of future-proof information technology.

"This is an important step towards seamless airspace management, the technological transition in Europe and the delivery of European digital airspace," said Henrik

Hololei, Director-General for Mobility and Transport at the European Commission. Arndt Schoenemann, DFS CEO said: "The management of a large European airspace based on a harmonised concept of operations between the two major upper area control centres in Europe will deliver direct benefits to all airspace users."

*–Editorial team–*

## Digital drone platform with a new look and feel

The Digital Platform for Unmanned Aviation, known as dipul from its German initials, is a development of DFS on behalf of the German Federal Ministry for Digital and Transport (BMDV). It provides drone operators with easy online access to map-based information on no-fly zones and information on the applicable rules. Almost one year after the launch of dipul, the DFS Systems House has now introduced the second update to the Map Tool. The new version not only has a new look, but also boasts improved usability and enhanced performance. The new features are intended to make the Map Tool simpler and more intuitive to use.

With the update, the accessibility requirements, which previously had to be activated by the users themselves in the settings, are integrated in the tool itself. The map material has a higher contrast, for example. The display of the map layers when the zoom level is low, and the restructured information in the menu also increase the clarity of the tool.

In addition, the usability has also been improved in the new version. The basic operation of the Map Tool remains the same, but has been optimised through minor changes. In the new version, for example, links to the legal basis for the information shown can be found directly in the tool. The rotation of the map has been optimised, too. This way, the street names remain legible even when the map is rotated. The change to the layer designators should also improve usability and make the display easier to understand.

In 2023, the expansion of the weather display, NOTAM and a no-fly zone editor are planned.



–Sven Chamberlain–

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